THEREFORE I CLAIM

1. An airfoil vortex dissipating system comprising:

a) an airfoil having a leading edge, a trailing edge, an outer end portion, an upper aerodynamic surface, a lower aerodynamic surface, a spanwise axis, a forward to rear chord axis, and an alignment reference plane coincident with the spanwise axis and the chord axis, said airfoil being characterized in that when the airfoil is functioning to create aerodynamic lift, a vortex is created at said outer end portion of the airfoil, with said vortex having vortex core axis, a main circumferential flow region and an outer perimeter flow region:

b) a vortex dissipating apparatus comprising:

i. a nozzle section which is at, or proximate to, said outer end portion of the airfoil, and has a nozzle discharge portion at an alignment location extending generally in a forward to rear direction at, or proximate to, the outer end portion of the airfoil, said nozzle section being arranged to discharge a jet air stream in a lateral discharge direction having a substantial discharge alignment component generally perpendicular to the chord axis and parallel to the alignment plane; and

ii. a pressurized air inlet section to supply pressurized air to said nozzle section to be discharged from said nozzle section;

2. The system as recited in claim 1, wherein said nozzle discharge portion is arranged to be actuated to move the lateral discharge direction of the jet air stream upwardly and downwardly between upper and lower end locations in a cyclical manner.

3. The system as recited in claim 2, wherein said nozzle discharge portion is arranged to move the lateral discharge direction of the jet air stream rotatably between an upper and lower location through an angle of at least as great as about one third of a right angle.

4. The system as recited in claim 2, wherein said nozzle discharge portion is arranged to move the lateral discharge direction of the jet air stream rotatably between an upper and lower location through an angle of at least as great as about two thirds of a right angle.

5. The system as recited in claim 2, wherein said nozzle discharge portion is arranged so that when the lateral discharge direction is at a generally central location between said upper and lower locations, said nozzle discharge portion is discharging said jet air stream so that the lateral discharge direction has a substantial alignment component generally perpendicular to the chord axis and generally parallel to the alignment reference plane.

6. The system as recited in claim 2, wherein said nozzle discharge portion is arranged so that when the lateral discharge direction is at a general central location between said upper and lower locations, said nozzle discharge system is discharging the jet air stream so that the lateral discharge direction has a substantial alignment component slanting downwardly and outwardly from the alignment reference plane.

7. The system as recited in claim 2, wherein said vortex dissipating apparatus is arranged so that cyclic frequency of said lateral discharge direction is sufficiently high so that dissipation of said vortex is accomplished by alleviating the intensity of the vortex.

8. The system as recited in claim 2, wherein said vortex dissipating apparatus is arranged so that cyclic frequency of movement of the lateral discharge direction is sufficiently low so that dissipation of said vortex is accomplished at least in part by accelerating instability which leads to vortex dissipation.

9. The system as recited in claim 7, wherein said cyclic frequency is greater than two Hertz.

10. The system as recited in claim 9, wherein said cyclic frequency is at least as great as about five Hertz.

11. The system as recited in claim 8, wherein said cyclic frequency is at least as low as about two Hertz.

12. The system as recited in claim 11,wherein said cyclic frequency is at least as low as approximately one Hertz.

13. The system as recited in claim 2, wherein said jet air stream comprises at least two air stream portions which are moved cyclically out of phase with one another.

14. A method of dissipating a vortex which is generated by an airfoil which is functioning to create aerodynamic lift, said airfoil having a leading edge, a trailing edge, an outer end portion, an upper aerodynamic surface, a lower aerodynamic surface, a spanwise axis, a forward to rear chord axis, and an alignment reference plane coincident with the spanwise axis and the chord axis, said method comprising:

a) positioning a nozzle section at, or proximate to the outer end portion of the airfoil, with a nozzle discharge portion at an alignment location extending generally in a forward to rear direction at, or proximate to, the outer end portion of the airfoil;

b) discharging a jet air stream from said nozzle discharge portion in a lateral discharge direction having a substantial discharge alignment component generally perpendicular to the chord axis and parallel to the alignment plane.

15. The method as recited in claim 14, wherein said nozzle discharge portion is operated to move the lateral discharge direction of the jet air stream upwardly and downwardly between upper and lower end locations in a cyclical manner.

16. The method as recited in claim 15, wherein said nozzle discharge portion is operated to move the lateral discharge

direction of the jet air stream rotatably between an upper and lower location through an angle of at least as great as about one third of a right angle.

17. The method as recited in claim 15, wherein said nozzle discharge portion is arranged to move the lateral discharge direction of the jet air stream rotatably between an upper and lower location through an angle of at least as great as about two thirds of a right angle.

18. The method as recited in claim 15, wherein said nozzle discharge portion is operated so that when the lateral discharge direction is at a generally central location between said upper and lower locations, said nozzle discharge portion is discharging said jet air stream so that the lateral discharge direction has a substantial alignment component generally perpendicular to the chord axis and generally parallel to the alignment reference plane.

19. The method as recited in claim 15, wherein said nozzle discharge portion is operated so that when the lateral discharge direction is at a general central location between said upper and lower locations, said nozzle discharge system is discharging the jet air stream so that the lateral discharge direction has a substantial alignment component slanting downwardly and outwardly from the alignment reference plane.

20. The method as recited in claim 15, wherein said vortex dissipating apparatus is operated so that cyclic frequency of said jet air stream in said lateral discharge direction is a

sufficiently high so that dissipation of said vortex is accomplished at least in part by alleviating the intensity of the vortex.

21. The method as recited in claim 20, wherein said vortex dissipating apparatus is operated so that cyclic frequency is of movement of the lateral discharge direction is sufficiently low so that dissipation of said vortex is accomplished at least in part by accelerating instability which leads to vortex dissipation.

22. The method as recited in claim 20, wherein said cyclic frequency is greater than two Hertz.

23. The method as recited in claim 22, wherein said cyclic frequency is at least as great as about five Hertz.

24. The method as recited in claim 21, wherein said cyclic frequency is at least as low as about two Hertz.

25. The method as recited in claim 24,wherein said cyclic frequency is at least as low as approximately one Hertz.

26. The method as recited in claim 15 wherein said air stream comprises at least two air stream portions which are moved cyclically out of phase with one another.

27. An airfoil vortex dissipating system comprising:

a) an airfoil having a leading edge, a trailing edge, an outer end portion, an upper aerodynamic surface, a lower aerodynamic surface, a spanwise axis, a forward to rear chord axis, and an alignment reference plane coincident with the spanwise axis and the chord axis,

said airfoil being characterized in that when the airfoil is functioning to create aerodynamic lift, a vortex is created at said outer end portion of the airfoil

b) a vortex dissipating apparatus comprising:

i. a nozzle section which is at, or proximate to, said outer end portion of the airfoil, and has an elongate nozzle discharge portion at, or proximate to, the outer end portion of the airfoil, said nozzle section being arranged to discharge an jet air stream in a discharge direction to move into said vortex a pressurized air inlet section to supply pressurized air to said nozzle section to be discharged from said nozzle discharge portion;

ii. said nozzle discharge portion being arranged to be actuated to change the discharge direction of the jet air stream in back and forth movement between first and second end locations in a cyclical manner.

28. The system as recited in claim 27, wherein said nozzle discharge portion is arranged to move the discharge direction of the jet air stream rotatably between a first and second location through an angle of at least as great as about one third of a right angle.

29. The system as recited in claim 27, wherein said nozzle discharge portion is arranged to move the lateral discharge

direction of the jet air stream rotatably between a first and second location through an angle of at least as great as about two thirds of a right angle.

30. The system as recited in claim 27, wherein said vortex dissipating apparatus is arranged so that cyclic frequency of the back and forth movement of said discharge direction is sufficiently high so that dissipation of said vortex is accomplished at least in part by alleviating the intensity of the vortex.

31. The system as recited in claim 27, wherein said vortex dissipating apparatus is arranged so that cyclic frequency of the back and forth movement of the discharge direction is sufficiently low so that dissipation of said vortex is accomplished at least in part by accelerating instability which leads to vortex dissipation.

32. The system as recited in claim 30, wherein said frequency is greater than two Hertz.

33. The system as recited in claim 32, wherein said cyclic frequency is at least as great as about five Hertz.

34. The system as recited in claim 31, wherein said cyclic frequency is at least as low as about two Hertz.

35. The system as recited in claim 34,wherein said cyclic frequency is at least as low as approximately one Hertz.

36. The system as recited in claims 27, wherein the nozzle discharge portion is arranged to move the lateral discharge direction of the jet air stream rotatably between an upper and

lower location through an angle of at least as great as about two thirds of a right angle.

37. A method of dissipating a vortex which is generated by an airfoil which is functioning to create aerodynamic lift, said airfoil having a leading edge, a trailing edge, an outer end portion, an upper aerodynamic surface, a lower aerodynamic surface, a spanwise axis, a forward to rear chord axis, and an alignment reference plane coincident with the spanwise axis and the cord axis, said method comprising:

a) positioning a nozzle section having a nozzle discharge portion at, or proximate to, the outer end portion of the airfoil;

b) discharging a jet air stream from said nozzle discharge portion in a discharge direction into said vortex;

c) moving the discharge direction cyclically back and forth as the jet air stream moves into the vortex.